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James T. Eckner, Jeffrey S. Kutcher, James K. Richardson (2010) Pilot Evaluation of a Novel Clinical Test of Reaction Time in National Collegiate Athletic Association Division I Football Players. *Journal of Athletic Training*: July/August 2010, Vol. 45, No. 4, pp. 327-332.

### Original Research

## Pilot Evaluation of a Novel Clinical Test of Reaction Time in National Collegiate Athletic Association Division I Football Players

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### Abstract

**Context:** Evidence suggests that concussion prolongs reaction time (RT). We have developed a simple, reliable clinical tool for measuring reaction time that may be of value in the assessment of concussion in athletes.

**Objective:** To compare baseline values of clinical RT ( $RT_{clin}$ ) obtained using the new clinical reaction time apparatus with computerized RT ( $RT_{comp}$ ) obtained using a validated computerized neuropsychological test battery.

**Design:** Cross-sectional study.

**Setting:** Data were collected during a National Collegiate Athletic Association Division I collegiate football team's preparticipation physical examination session.

**Patients or Other Participants:** Ninety-four Division I collegiate football players.

**Main Outcome Measure(s):** The  $RT_{clin}$  was measured using a 1.3-m measuring stick embedded in a weighted rubber disk that was released and caught as quickly as possible. The  $RT_{comp}$  was measured using the simple RT component of CogState Sport.

**Results:** For the 68 athletes whose CogState Sport tests passed the program's integrity check,  $RT_{clin}$  and  $RT_{comp}$  were correlated ( $r = 0.445$ ,  $P < .001$ ). Overall, mean  $RT_{clin}$  was shorter and less variable than mean  $RT_{comp}$  ( $203 \pm 20$  milliseconds versus  $268 \pm 44$  milliseconds;  $P < .001$ ). When  $RT_{clin}$  and  $RT_{comp}$  were compared between those athletes with ( $n = 68$ ) and those without ( $n = 26$ ) valid CogState Sport test sessions, mean  $RT_{clin}$  was similar ( $202 \pm 19$  milliseconds versus  $207 \pm 23$  milliseconds;  $P = .390$ ), but mean  $RT_{comp}$  was different ( $258 \pm 35$  milliseconds versus  $290 \pm 55$  milliseconds;  $P = .009$ ).

**Conclusions:** The  $RT_{clin}$  was positively correlated with  $RT_{comp}$  and yielded more

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### Journal Information

Print ISSN 1062-6050

eISSN 1938-162X

Frequency Bimonthly:

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November/December

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consistent reaction time values during baseline testing. Given that  $RT_{clin}$  is easy to measure using simple, inexpensive equipment, further prospective study is warranted to determine its clinical utility in the assessment of concussion in athletes.

**Keywords:** [concussions](#), [mild traumatic brain injuries](#), [neuropsychological tests](#), [athletes](#), [assessment](#), [motivation](#)

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